

Indicator 18. Area and Percent of Forest Land with Significant Soil Erosion

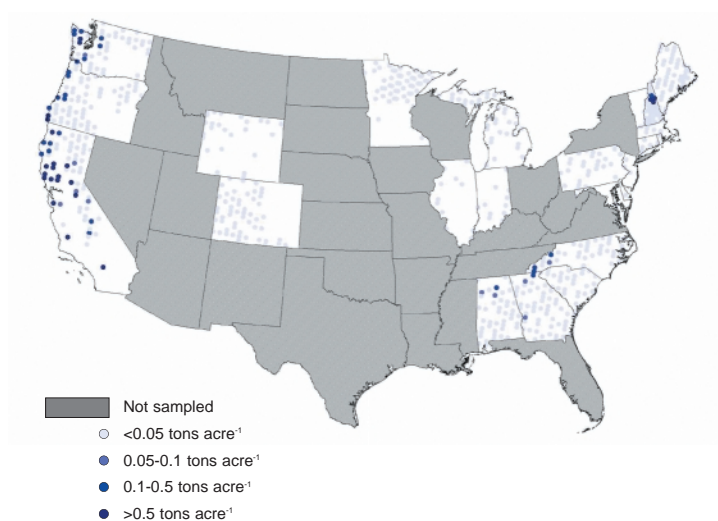


Figure 18-1. Modeled erosion rates on forest health monitoring plots (1999) under average climatic conditions (2-year return interval) using the Water Erosion Prediction Project model.

What Is the Indicator and Why Is It Important?

Erosion removes stored nutrients and organic matter from the soil surface, diminishes the capacity of the soil to support vegetation, and can represent a threat to soil, water, and related forest resources. This indicator measures the extent of accelerated erosion in forests that is sufficient to lower soil productivity or cause significant sediment delivery to streams. Long-term rates of geologic erosion or mass wasting events are not considered in this analysis.

What Does the Indicator Show?

Potential erosion rates for plots measured in 1999 as part of the Forest Health Monitoring Program (FHM) were modeled using the Water Erosion Prediction Project. Modeled erosion rates on undisturbed forest land were generally small, with nearly 90 percent of the 677 plots modeled having potential erosion rates of less than 0.05 tons acre⁻¹ under average precipitation events (2-year return interval). For comparison, these

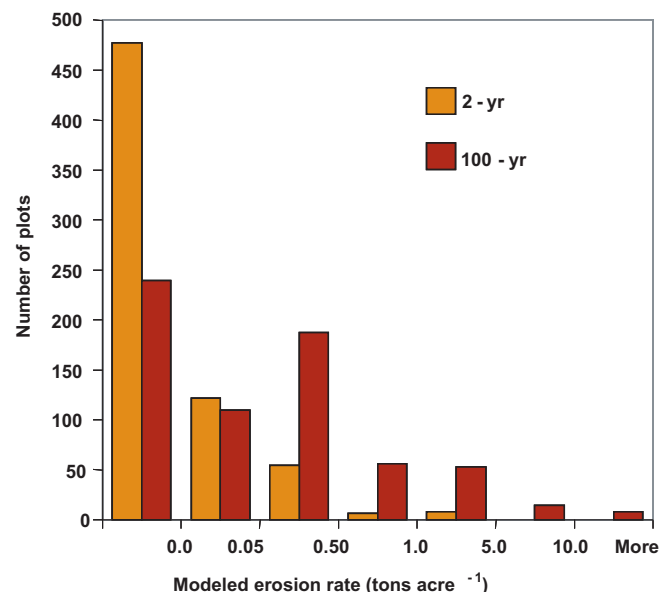


Figure 18-2. Frequency distribution for modeled erosion rates on forest health monitoring plots (1999) following 2-year (average) and 100-year storm events.

values are an order of magnitude smaller than the 3.1 tons/acre/year estimated for agricultural lands (1997 National Resources Inventory). Following a more severe precipitation event (100-year storm), modeled erosion rates increased, with 19.6 percent of plots having a modeled erosion rate greater than 0.5 tons acre⁻¹ (median 0.04 tons acre⁻¹). Sensitivity analyses indicate that disturbances can increase erosion rates by two to three orders of magnitude in the first year after the disturbance. Exposed mineral soil was a common occurrence in all regions of the country sampled, with most plots (65 percent) reporting bare soil on less than 5 percent of the plot.

Erosion estimates are limited by model assumptions, and aggregate estimates of soil erosion often have little meaning in and of themselves because of the natural variability in soil erosion. The term "significant" needs to be defined with respect to variation among different landscapes, soils, and vegetation communities.